Why we sleep: Unlocking the power of sleep:

1. Chapter 1: This thing called sleep:

a. The shorter your sleep, the shorter your life span.
b. Sleep is the most effective thing we can do to reset our brain and body health each day.

2. Chapter 2: Caffeine, Jet Lag, and Melatonin:

a. **Circadian Rhythm**:
    i. A **circadian rhythm** refers to the natural, internal process that regulates the sleep-wake cycle and repeats roughly every 24 hours. It is influenced by environmental factors, primarily light and darkness. In humans, it helps determine our sleep patterns, hormone release, body temperature, and other vital bodily functions.

    The circadian rhythm is controlled by the brain's **suprachiasmatic nucleus (SCN)** in the hypothalamus, which responds to light signals from the eyes, helping the body adjust to day and night. Disruptions to this rhythm, such as jet lag or irregular sleep schedules, can affect overall health and well-being.

    ii. **Definition**: A natural, internal process that regulates the sleep-wake cycle, repeating roughly every 24 hours.

    iii. **Function**:

        1. This internal clock sends different signals at various times, promoting wakefulness during the day and sleepiness at night.

2. It controls the release of melatonin (sleep hormone) and cortisol (stress hormone).

3. Temperature tends to fluctuate based on circadian rhythms—lowest during sleep.

4. It helps regulate hunger and digestion patterns in coordination with daily meal times.

5. **Melatonin release** is inhibited by exposure to light, and as darkness falls, melatonin production increases, making you feel sleepy.

6. **Avoid bright lights in the evening**, particularly blue light from screens.

iv. **Research**: Studies by Nathaniel Kleitman and Bruce Richardson in 1938 showed that the circadian rhythm can vary among individuals. The average adult's endogenous circadian clock is about 24 hours and 15 minutes.

v. **Zeitgebers**: Environmental cues (like sunlight) that help synchronize the circadian clock. Other zeitgebers include food, exercise, and temperature.

b. **Chronotypes**:
   i. **Morning Types ("Larks")**: Peak in wakefulness during the day and feel sleepy early at night (about 40% of the population).
   ii. **Evening Types ("Owls")**: Prefer to stay up late and sleep in (about 30% of the population). Genetics determine these chronotypes.
   iii. **Challenges for Night Owls**: Often viewed negatively in society, they struggle with typical early schedules, leading to sleep deprivation.

c. **Adenosine**:
    i. **Role**: A chemical that accumulates in the brain while awake, promoting sleepiness. The longer one stays awake, the more adenosine is produced.

    ii. **Peak Levels**: Most people experience peak levels of adenosine after 12 to 16 hours of wakefulness, leading to a strong desire to sleep at night.

d. **Caffeine's Impact**:
    i. Caffeine-which is not only prevalent in coffee, certain teas, and many energy drinks, but also foods such as dark chocolate and ice cream, as well as drugs such as weight-loss pills and pain relievers-is one of the most common culprits that keep people from falling asleep easily and sleeping soundly thereafter, typically masquerading as insomnia, an actual medical condition. Also be aware that de-caffeinated does not mean non-caffeinated.

    ii. It acts as a stimulant by blocking adenosine receptors, allowing individuals to feel alert despite high adenosine levels. But, adenosine keep on accumulating.

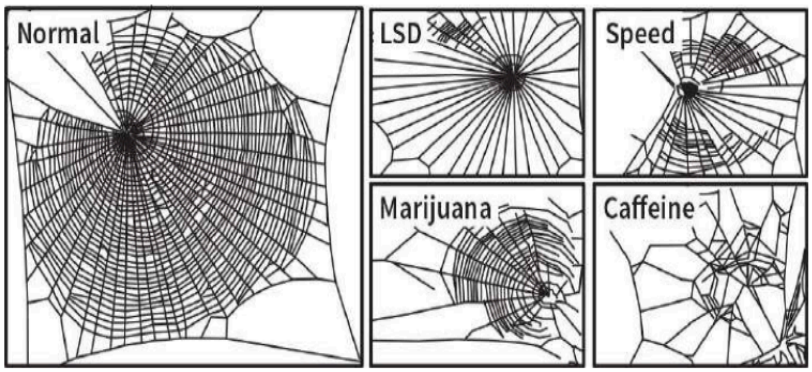
    iii. Peaks in the bloodstream about 30 minutes after consumption and can remain effective for several hours.

    iv. Caffeine sensitivity varies among individuals; some can consume it late without issue, while others may struggle with insomnia.

    v. **Caffeine Crash**: After caffeine wears off by liver and totally depend on aging process, receptor get empty and occupied by the adenosine. Individuals may

experience a significant urge to sleep due to the accumulated adenosine. Performance of spider tested at lab after caffeine crash.

Figure 3: Effects of Various Drugs on Spider Web Building



e. Meaningful Points

i. **Independent Mechanisms**: Circadian rhythms and adenosine levels function independently but typically work together to regulate sleep patterns.

Figure 4: The Two Factors Regulating Sleep and Wakefulness

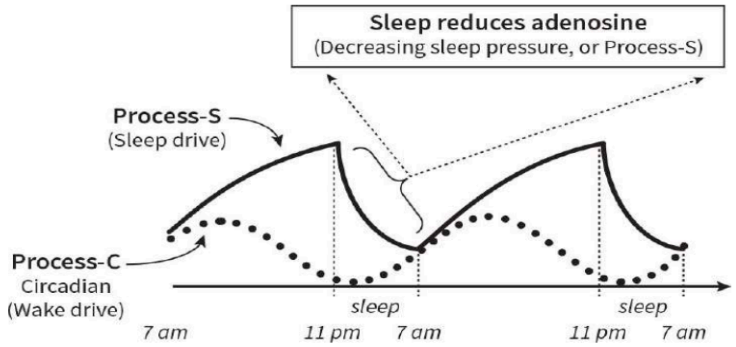


Figure 5: The Urge to Be Awake

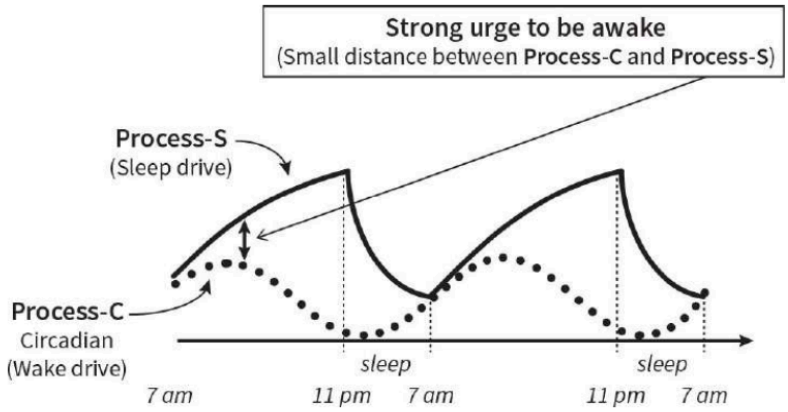


Figure 6: The Urge to Sleep

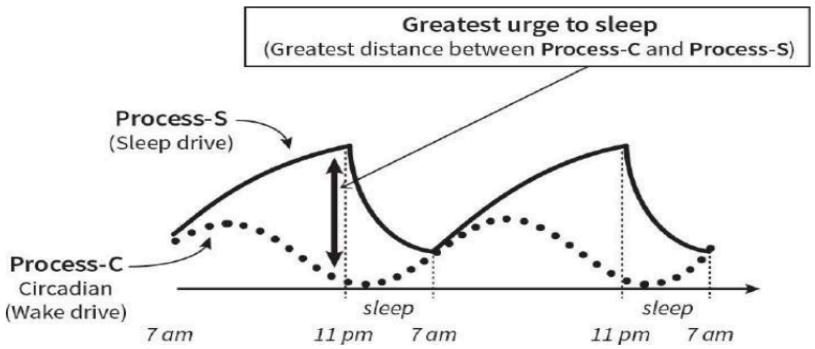
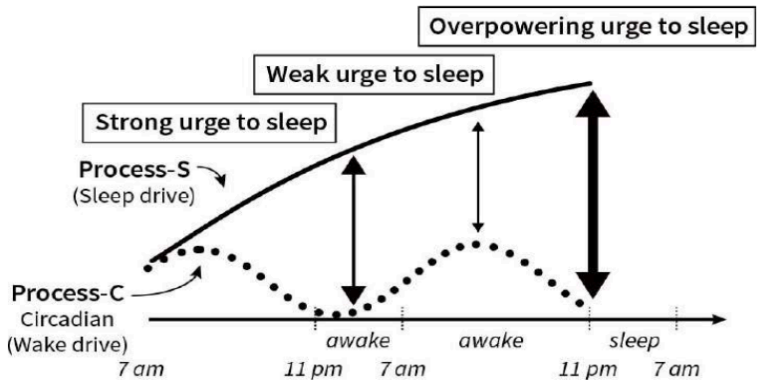


Figure 7: The Ebb and Flow of Sleep Deprivation



ii. **Health Implications**: Misalignment of circadian rhythms and reliance on caffeine can lead to sleep deprivation, particularly for night owls in a society favouring early schedules.

iii. **Sleep Quality**: While melatonin can help signal the body to sleep, it doesn't necessarily improve sleep quality, highlighting the complexity of sleep regulation.

iv. How do you know you get enough sleep?

v. Am I Getting Enough Sleep?

1. Two rules of thumb:
    a. After waking up in the morning, could you fall back asleep at ten or eleven a.m.? If yes, then you're probably not getting enough quality sleep.

    b. Can you function optimally without caffeine before noon? If no, then you are most likely self-medicating your state of chronic sleep deprivation.

3. Chapter 3: Defining and Generating Sleep:

a. Self-Identifying Sleep:

i. Sleeping organisms adopt a stereotypical position.
ii. Sleeping organisms have lowered muscle tone.
iii. Sleeping individuals show no overt displays of communication or responsivity.
iv. Sleep is easily reversible, differentiating it from coma, anesthesia, hibernation, and death.
v. Sleep adheres to a reliable timed pattern across 24-hours.
vi. The thalamus is the sensory gate of the brain. It puts up a perceptual barricade to block incoming sensory signals while you sleep.
vii. You consciously lose track of time while you sleep.
viii. But your subconscious brain is still capable of logging time with quite remarkable precision while asleep.

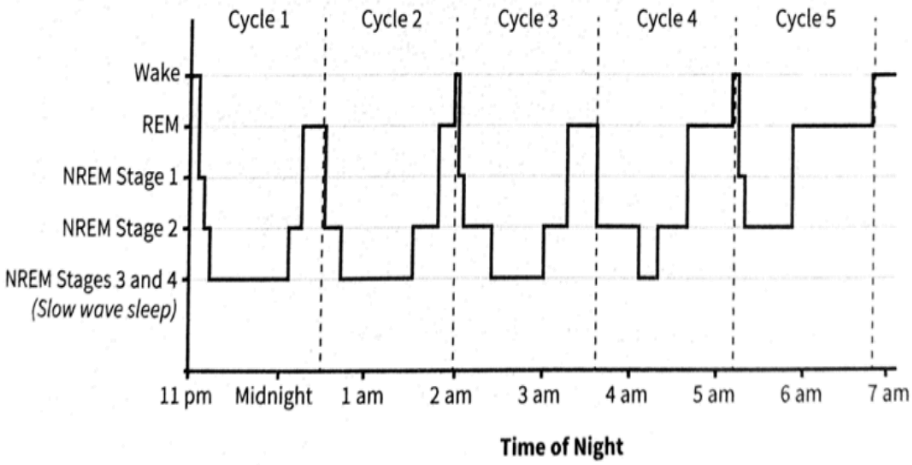
Thus, why you sometimes wake up right before your alarm goes off.

ix. When you dream, you maintain a sense of time, however, it is not particularly accurate. Often dream-time is prolonged relative to real time

b. The Sleep Cycle:

i. NREM and REM stages play out in a recurring, push-pull battle for brain domination across the night in 90-minute intervals.

Figure 8: The Architecture of Sleep

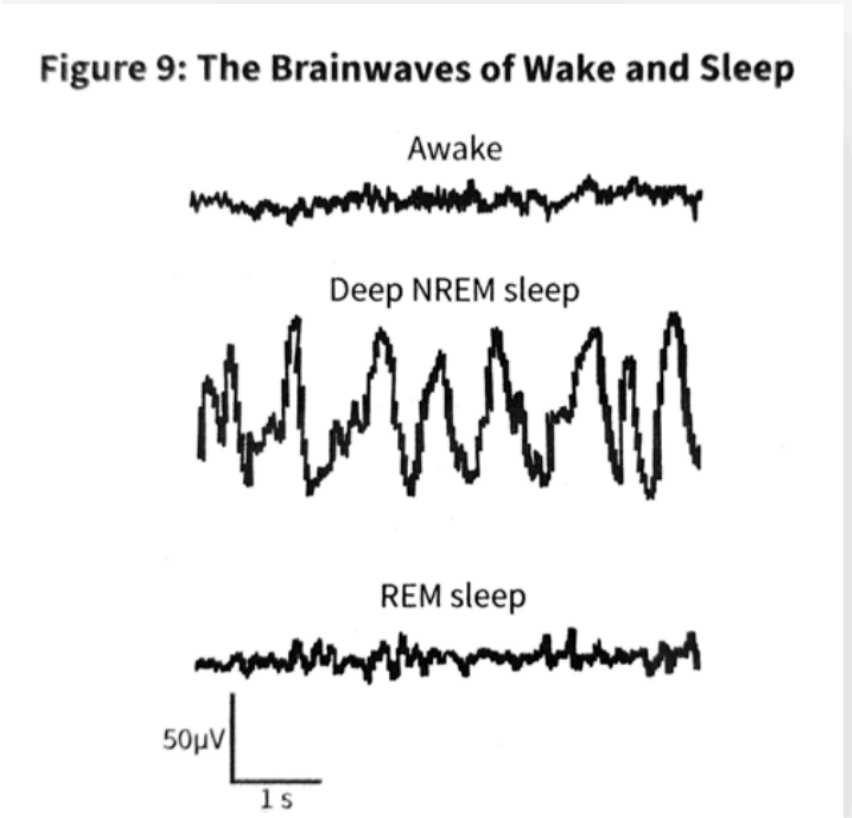


ii. A key function of deep NREM sleep, which predominates early in the night, is to do the work of weeding out and removing unnecessary neural connections.

iii. When it comes to information processing, think of the wake state principally as reception (experiencing and constantly learning the world around you), NREM sleep as reflection (storing and strengthening those raw ingredients of new facts and skills) – much muscle tension disappear some remain,

iv. and REM sleep as integration (interconnecting these raw ingredients with each other, with all past experiences, and, in doing so, building an ever more accurate model of how the world works, including innovative insights and problem-solving abilities). – “atonia” an absence of tone, referring to the muscles is instigated by a powerful disabling signal that is transmitted down the full length of your spinal cord from your brain stem. All the biceps and quadriceps of leg, lose all strength and tension. No respond to the command of brain. You became embodied prisoner incarcerated by REM sleep. Your body is freed as REM sleep ends. But muscles that control automatic operations such as breathing – continue to operate and maintain life during sleep.

v. Why did evolution decide to outlaw muscle activity during REM sleep? Because by eliminating muscle activity you are prevented from acting out your dream experience.



WALKER, MATTHEW (2017) *WHY WE SLEEP*. NEW YORK: SCRIBNER. P. 47 FIGURE 9

vi. Place your finger between your eyes, just above the bridge of the nose. Now slide it up your forehead about two inches. When you go to bed tonight, this is where most of the deep-sleep brainwaves will be generated: right in the middle of frontal lobes. It is the epicenter, or hot spot, form which most of your deep, slow-wave sleep emerges.

4. Chapter 3: Defining and Generating Sleep:

a. Self-Identifying Sleep:

i. Who Sleeps:

1. Sleep is universal. Without exception, every animal species studied to date sleeps, or engages in something remarkably like it.

ii. One of These is Not Like the Other:

1. ***Total amount of time*** **is one of the most conspicuous differences in how organisms sleep.**
2. Elephants sleep just 4 hours. Brown bats sleep 19 hours.
3. **We don't really know why it varies so much from one species to another.**

iii. To Dream Or Not To Dream:

1. Not all species experience all stages of sleep.
2. All have measurable NREM sleep stages.
3. **Insects, amphibians, fish, and most reptiles show no clear signs of REM sleep—the type associated with dreaming in humans.**

iv. If Only Humans Could:

1. The *way* species sleep varies widely.
2. **Cetaceans (such as dolphins and whales) and birds sleep with half a brain at a time.**
3. REM sleep is strangely immune to being split across sides of the brain. Split brain sleeping only applies to NREM.

v. Under Pressure:

1. Starvation will cause the search for food to supersede the need for sleep.

2. In flight, migrating birds will grab remarkably brief periods of sleep lasting only seconds in duration.

vi. How Should We Sleep?

1. Hunter-gatherer tribes, such as the Gabra in northern Kenya or the San people in the Kalahari Desert, sleep in a ***biphasic*** **pattern**. Both these groups take a similarly longer sleep period at night (7-8 hours), followed by a 30-60 minute nap in the afternoon.
2. They go to sleep two to three hours after sunset, around 9 PM.
3. **Midnight is supposed to be "mid-night." Instead, for many of us, it's usually the time when we consider checking our email one last time.**
4. All humans, irrespective of culture or geographical location, have a **genetically hardwired dip in alertness that occurs in the mid-afternoon hours.**
5. **When we are cleaved from the innate practice of biphasic sleep, our lives are shortened.**

vii. We Are Special:

1. The total amount of time we spend asleep is markedly shorter than all other primates, yet we have a disproportionate amount of REM sleep, the stage in which we dream.
2. REM sleep exquisitely recalibrates and fine-tunes the emotional circuits of the human brain.
3. REM-sleep dreaming state fuels creativity.
4. Form the REM-sleep-enhanced emotional IQ emerged a new and far more sophisticated form of hominid socioecological across vast collectives, one that helped enable the creation of large, emotionally astute, stable, highly

bonded and intensely social communities of humans.

5. Changes in Sleep Across the Life Span:

a. Sleep Before Birth

i. **Prior to birth, a human infant will spend almost all of its time in a sleep-like state, much of which resembles the REM-sleep state.**

ii. Infants and young children who show signs of autism, or who are diagnosed with autism, do not have normal sleep patterns or amounts. Most notably is the shortage of REM—30-50% less than children without autism.

b. Childhood Sleep

i. Infants and young kids display polyphasic sleep: many short snippets of sleep through the day and night.

ii. The master 24-hour clock that controls the circadian rhythm—the suprachiasmatic nucleus—takes considerable time to develop.

c. Sleep and Adolescence

i. During puberty, NREM sleep ramps up to prune brain connections with the goal of efficiency and effectiveness.

ii. **Deep sleep may be a driving force of brain maturation.**

iii. The circadian rhythm of adolescent teenagers shifts forward, so far that it passes the timing of their adult parents. **So they want to stay up later.**

iv. **Asking your teenager to go to bed and fall asleep at 10 PM is the circadian equivalent of asking you, their parent, to go to sleep at 7 or 8 PM.**

v. Neither society nor our parental attitudes are well designed to appreciate or accept that teenagers need

more sleep than adults, and that they are biologically wired to obtain that sleep at a different time than their parents.

d. Sleep in Midlife and Old Age

i. Sleep is more problematic and disordered in older adults.

ii. **Older adults need just as much sleep as they do in midlife, but are simply less able to generate that (still necessary) sleep.**

iii. REM sleep remains largely stable in midlife. **But the decline of NREM sleep is already under way by your late twenties and early thirties.**

iv. The older we get, the more frequently we wake up throughout the night. The chief culprit is a weakened bladder.

v. **The lower an older individual's sleep efficiency score, the higher their mortality risk, the worse their physical health, the more likely they are to suffer from depression, the less energy they report, and the lower their cognitive function, typified by forgetfulness.**

6. <u>Your Mother and Shakespeare Knew: The Benefits of Sleep for Your Brain</u>

a. Sleep-The-Night-Before Learning

i. **Sleep restores the brain's capacity for learning, making room for new memories.**

ii. The more sleep spindles an individual has at night, the greater the restoration of overnight learning ability come the next morning.

b. Sleep-The-Night-After Learning

i. **Sleep is like clicking the "save" button.** It protects newly acquired information against forgetting.

ii. The slow brainwaves of deep NREM sleep(stage 2) serves as a courier service, transporting memory packets from a temporary storage hold (hippocampus) to a more secure, permanent home (the cortex).

iii. Sleep Spindles: Short bursts of brain activity during non-REM stage 2 sleep, lasting about 0.5–2 seconds, play a key role in memory processing.

iv. Memory Transfer: Sleep spindles create a communication loop between the hippocampus (short-term storage) and the cortex (long-term storage), moving memories to free up space for new information.

v. Learning Enhancement: More sleep spindles correlate with increased learning capacity, regardless of natural learning ability, by refreshing short-term memory stores.

vi. Aging Impact: Older adults produce fewer sleep spindles, reducing overnight memory consolidation and making it harder to learn new information the next day.

vii. Cognitive Health Implications: Research suggests that increasing sleep spindle activity could help preserve memory and learning in older adults, potentially through therapies like transcranial magnetic stimulation (TMS).

viii. Sleep clears out the cache of short-term memory for the new imprinting of facts, while accumulating an ever-updated catalog of past memories.

ix. Sleep salvages memories that appeared to have been lost soon after learning.

x. Two experimental methods have shown promise in enhancing memory during sleep:

1. Sleep Stimulation: Applying gentle electrical pulses in sync with NREM slow waves nearly doubled participants' recall of learned information.
2. Targeted Memory Reactivation: Playing rhythmic, quiet tones synchronized with the brain’s slow waves improved memory retention by 40%.

c. Sleep to Forget?

i. Sleep's Discerning Role: Contrary to earlier beliefs, sleep does not reinforce all learned information; it selectively enhances only important memories based on meaningful "tags" created during learning or identified during sleep.

ii. Role of NREM Sleep and Sleep Spindles: NREM sleep, especially rapid sleep spindles, helps differentiate between remembering and forgetting. More spindles during naps improve selective memory retention and forgetting.

iii. Brain Activity During Sleep Spindles: During sleep spindles, brain activity loops between the hippocampus (memory storage) and the frontal lobe (intentionality), which may help selectively store or discard memories.

d. Sleep for Other Types of Memory

i. Muscle memory is actually brain memory. Our brains remember how to do things.

ii. **Practice, followed by a night of sleep, makes perfect.**

iii. Daytime naps that contain sufficient numbers of sleep spindles also offer significant motor skill memory improvement, together with a restoring benefit on perceived energy and reduced muscle fatigue.

iv. Sleep had systematically identified where the difficult transitions were in the motor memory and smoothed them out.

v. Sleep had again transferred the memories, but the results were different from that for textbook-like memory. Rather than a transfer from short- to long-term memory required for saving facts, the motor memories had been shifted over to brain circuits that operate below the level of consciousness. As a result, those skill actions were now instinctual habits. They flowed out of the body with ease, rather than feeling effortful and deliberate. Which is to say that sleep helped the brain automate the movement routines, making them second nature-effortless-precisely the goal of many an Olympic coach when perfecting the skills of their elite athletes.

vi. The increases in speed and accuracy, underpinned by efficient automaticity, were directly related to the amount of stage 2 NREM, especially in the last two hours of an eight-hour night of sleep (e.g., from five to seven a.m., should you have fallen asleep at eleven p.m.). Indeed, it was the number of those wonderful sleep spindles in the last two hours of the late morning— the time of night with the richest spindle

bursts of brainwave activity-that were linked with the offline memory boost.

vii. The increase in sleep spindles after learning was observed specifically above the motor cortex(just in front of the crown of your head), indicating a localized effect. Greater spindle activity in this region correlated with improved performance upon awakening. This "local-sleep"-and-learning effect suggests that while sleep spindles affect the entire brain, they focus more on areas most engaged in motor skill learning, much like a masseuse targeting specific areas in need of attention.

viii. Sleep is an insurance policy against injury.

7. Too Extreme for the Guinness Book of World Records:

a. **Vehicle accidents caused by drowsy driving exceed those caused by alcohol and drugs *combined.***
b. After being awake for nineteen hours, people who were sleep-deprived were as cognitively impaired as those who were legally drunk.
c. Humans have a cognitive "recycle rate" of about 16 hours; after this, the brain starts to fail. More than 7 hours of sleep per night is needed for optimal cognitive performance. Ten days of getting only 7 hours of sleep nightly causes the brain to function as poorly as after 24 hours of no sleep. Three nights of recovery sleep (more than just a weekend) aren't enough to fully restore brain function after a week of insufficient sleep. Sleep-deprived individuals cannot accurately gauge their own level of sleep deprivation.

d. Emotional Reactivity Amplified by Sleep Deprivation:
    i. Sleep-deprived individuals showed a 60% increase in emotional reactivity in the amygdala, leading to heightened anger and stress responses.
    ii. Well-rested individuals had controlled amygdala responses, indicating sleep helps manage emotions effectively.

e. Role of the Prefrontal Cortex:
    i. After sufficient sleep, the prefrontal cortex (responsible for rational thinking) is tightly coupled with the amygdala, acting as an "emotional brake."
    ii. Sleep loss disrupts this connection, causing unregulated, impulsive emotional reactions due to the amygdala's heightened activity.

f. Chronic Sleep Deprivation's Emotional Effects:
    i. Both total sleep loss and restricted sleep (5 hours/night for multiple nights) cause similar emotional dysregulation, confirmed by Japanese research.
    ii. Extreme Emotional Swings in Sleep-Deprived Individuals:
        1. Participants showed dramatic mood swings between positive and negative emotions, quickly fluctuating between irritability, giddiness, and negativity.
        2. This swing suggested that sleep deprivation affects more than just negative emotions—it heightens both positive and negative responses.

g. Heightened Reward Sensitivity in Sleep-Deprived Brain:
    i. Sleep deprivation causes overactivity in the striatum, a reward center linked to impulsivity and dopamine, leading to increased sensitivity to pleasurable stimuli.
    ii. This reward sensitivity, without prefrontal control, risks impulsivity and poor decision-making.

h. Risks of Extreme Emotional States:
    i. Extreme negative mood from sleep deprivation is linked to depression, suicidal thoughts, and behavioral problems, particularly in teens and children.
    ii. Positive emotional extremes can lead to risk-taking, sensation-seeking, addiction, and early onset of substance use.

i. Behavioral and Social Implications:
    i. In children and adults, insufficient sleep is associated with aggression, bullying, and violence.
    ii. In adult prison populations, sleep deprivation correlates with increased violence, psychiatric issues, and suicide risk, indicating potential benefits of improved sleep conditions in reducing these issues.

j. Sleep Deprivation and Addiction:
    i. Lack of sleep is linked to addiction development, increased relapse rates, and craving without rational restraint.
    ii. Children with inadequate sleep are more likely to engage in early substance use, highlighting sleep's role in emotional stability and impulse control.

k. Students who stay up late cramming for tests experience a 40% deficit in their ability to make new memories relative to those that get a full nights sleep.
l. If you don't sleep the very first night after learning, you lose the chance to consolidate those memories, even if you get lots of catch-up sleep thereafter.
m. **Wakefulness is low-level brain damage, while sleep is neurological sanitation.**
n. Getting too little sleep across the adult life span will significantly raise your risk of developing Alzheimer's disease.
o. Nedergaard's findings completed the circle of knowledge that our findings had left unanswered. Inadequate sleep and the pathology of Alzheimer's disease interact in a vicious cycle. Without sufficient sleep, amyloid plaques build up in the brain, especially in deep-sleep-generating regions, attacking and degrading them. The loss of deep NREM sleep caused by this assault therefore lessens the ability to remove amyloid from the brain at night, resulting in greater amyloid deposition. More amyloid, less deep sleep, less deep sleep, more amyloid, and so on and so forth.

8. Cancer, Heart Attack, and Shorter Life:

a. Unhealthy sleep, unhealthy heart.
b. Adults 45+ who sleep <6 hours are 200% more likely to have a heart attack or stroke compared to those sleeping 7-8 hours.
c. In the Northern Hemisphere, the switch to daylight savings time in March results in most people losing an hour of sleep opportunity. When viewed across the millions of daily hospital records, this seemingly trivial sleep reduction

comes with a frightening spike in heart attacks the following day.

d. The less you sleep, the more you are likely to eat.
e. Chronic sleep deprivation is one of the major contributors to type 2 diabetes.
f. Insufficient sleep is linked to obesity.
g. Short sleep causes the body to deplete muscle mass and retain fat.
h. Men who suffer from sleep disorders (sleep apnea and snoring) have significantly lower levels of testosterone.
i. Your immune response suffers after a single night of reduced sleep.

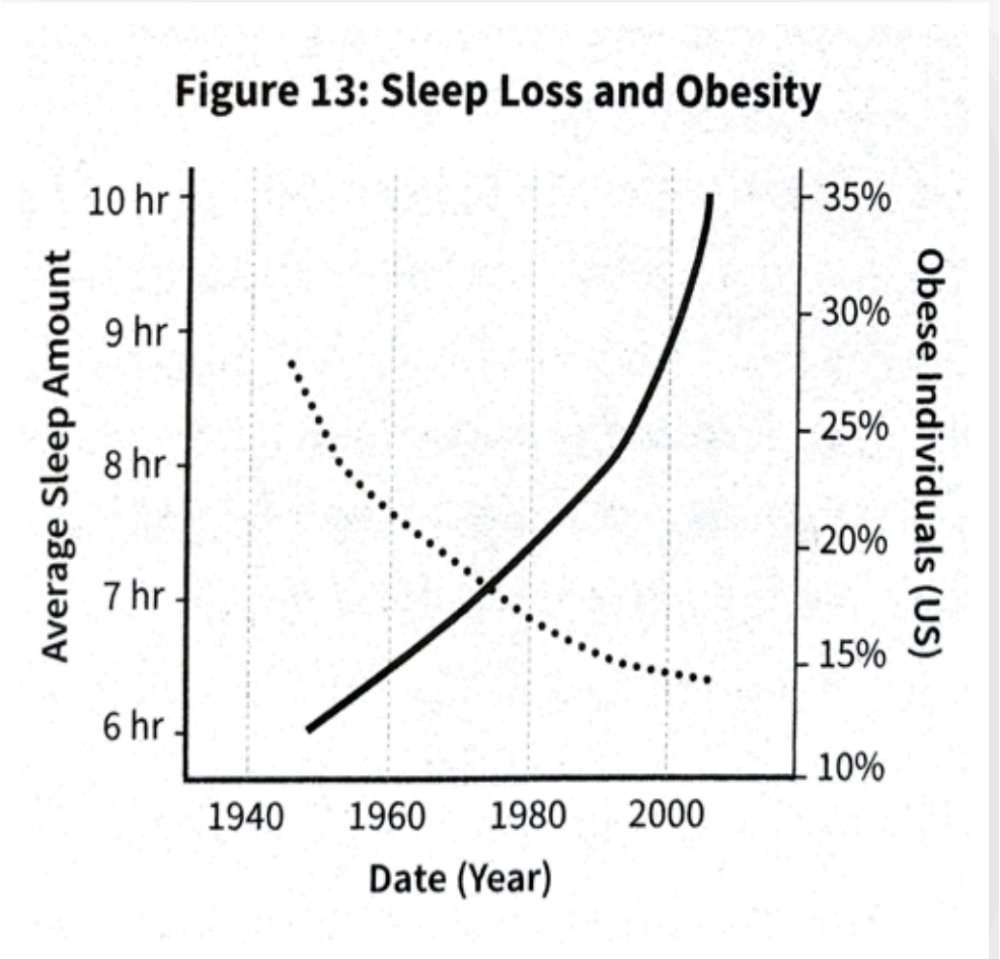


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FIGURE 13

How and why we dream:

9. Routinely Psychotic:

a. REM sleep accounts for the hallucinogenic, emotional , and bizarre experiences with a rich narrative.

b. REM sleep is a state characterized by strong activation in visual, motor, emotional, and autobiographical memory regions of the brain, yet a relative deactivation in regions that control rational thought.

c. MRI scans be used to predict with significant accuracy the content of your dreams by matching images of brain activity to baseline templates.

d. Dreams are not a wholesale replay of our waking lives.

e. Daytime emotions, however, do have some influence over the emotional themes of our dreams.

10. Dreaming as Overnight Therapy:

a. REM sleep helps us divorce emotion from experience. We can therefore learn and usefully recall salient life events without being crippled by the emotional baggage that those painful experiences originally carried.

b. In fact, REM sleep is the only time during the twenty-four-hour period when your brain is completely devoid of this anxiety-triggering molecule. Noradrenaline, also known as norepinephrine, is the brain equivalent to a body chemical you already know and have felt the effects of: adrenaline (epinephrine).

c. Dreaming about difficult life events helps people gain clinical resolution from their despair.

d. Like a master piano tuner, REM sleep readjusts the brain's emotional instrument at night to pitch-perfect precision.

e. There are regions of your brain whose job it is to read and decode the value and meaning of emotional signals, especially faces. And it is that very same essential set of brain regions, or network, that REM sleep recalibrates at night.

11. **Dream Creativity and Dream Control:**
    a. Sleep builds connections between distantly related informational elements that are not obvious in the light of waking day.
    b. Relational memory processing receives an accelerated boost from REM sleep.
    c. Like an insightful interviewer, dreaming takes the approach of interrogating our recent autobiographical experience and skillfully positioning it within the context of past experiences and accomplishments, building a rich tapestry of meaning.
    d. Lucid dreaming is possible. Some people can control when and what they dream while they are dreaming.

12. iPads, Factory Whistles, and Nightcaps: What's Stopping You From Sleeping?

a. Constant electric light
b. Alcohol
c. Regularized temperature
d. Caffeine (Chapter 2)
e. A legacy of punching time cards

f. Modern Light
    i. Artificial evening light will fool your suprachiasmatic nucleus into believing the sun has not yet set.
    ii. Melatonin is not released on schedule.

iii. **Evening blue LED light has twice the harmful impact on nighttime melatonin suppression than warm, yellow light from old incandescent bulbs.**
iv. Maintaining complete darkness throughout the night is equally critical.

g. Alcohol

i. **Alcohol fragments sleep, therefore sleep is not continuous and not restorative.**
ii. Alcohol is a powerful REM suppressor, depriving you of dream sleep.

h. Temperature

i. **Core body temp must decrease 2-3 degrees Fahrenheit to initiate sleep.**
ii. 65 degrees is ideal.
iii. Body temp is controlled by your hands, feet, and head. Warm these areas to draw out heat trapped in the body's core.

i. Industry

i. The affects of being artificially wrenched from sleep (alarm clocks) include a spike in blood pressure and a shock acceleration in heart rate caused by an explosive burst of activity from the flight-or-flight branch of the nervous system.
ii. Don't press snooze and afflict yourself to this more than once.

13. Hurting and Helping Your Sleep: Pills vs. Therapy

a. Cognitive Behavioral Therapy for Insomnia

i. Techniques intended to break bad sleep habits and address anxieties that inhibit sleep.

1. Establish a regular bedtime and wake-up time, even on weekends.
2. Go to bed only when sleepy and avoid sleeping on the couch early/mid-evenings.
3. Never lie awake in bed for a significant period of time.
4. Avoid daytime napping.
5. Reduce anxiety-provoking thoughts and worries.
6. Remove visible clock faces from view in the bedroom.

14. Appendix:

a. Twelve Tips for Healthy Sleep

i. Stick to a sleep schedule
ii. Exercise is great, but not too late in the day. Try to exercise at least thirty minutes on most days but not later than two to three hours before your bedtime.
iii. Avoid caffeine and nicotine.
iv. Avoid alcoholic drinks before bed.
v. Avoid large meals and beverages late at night.
vi. If possible, avoid medicines that delay or disrupt your sleep.
vii. Don’t take naps after 3 p.m.
viii. Relax before bed. Don’t overschedule your day so that no time is left for unwinding. A relaxing activity, such as reading or listening to music, should be part of your bedtime ritual.
ix. Take a hot bath before bed.
x. Dark bedroom, cool bedroom, gadget-free bedroom.
xi. Have the right sunlight exposure. Daylight is key to regulating daily sleep patterns. Try to get outside in natural sunlight for at least thirty minutes each day. If possible, wake up with the sun or use very bright lights in the morning.

xii. Don’t lie in bed awake.